

Application No. 09/522,958
Response dated November 3, 2003
Reply to Office Action of July 1, 2003

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Previously Presented) A liquid crystal display device comprising:
a liquid crystal display which uses reflective type liquid crystal with a memory effect;
a driving circuit which performs image writing on the liquid crystal display;
a power supply circuit which supplies electric power to the driving circuit, the power supply circuit including one element selected from the group consisting of a booster circuit and a DC/DC converter; and
a controller which inactivates at least part of the power supply circuit after completion of the image writing.
2. (Previously presented) A liquid crystal display device according to claim 1, wherein, if the power supply circuit includes a booster circuit, the controller inactivates the booster circuit after completion of the image writing.
3. (Previously Presented) A liquid crystal display device comprising:
a liquid crystal display which uses reflective type liquid crystal with a memory effect;
a driving circuit which performs image writing on the liquid crystal display;
a data processing unit which is connected to the driving circuit, the data processing unit incorporating at least one central processing unit; and
a controller which inactivates at least part of an internal circuit of the at least one central processing unit after completion of the image writing.
4. (Previously Presented) A liquid crystal display device according to claim 3, wherein the at least one central processing unit is capable of operating in a sleep

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mode to inactivate part of the internal circuit by itself after completion of the image writing.

5. (Previously Presented) A liquid crystal display device according to claim 1, not comprising a power switch for turning on and off a main power source.

6. (Previously Presented) A liquid crystal display device according to claim 1, wherein the liquid crystal display uses liquid crystal which exhibits a cholesteric phase.

7. (Previously Presented) A liquid crystal display device according to claim 3, wherein:

the data processing unit incorporates a plurality of central processing units; and
the controller also inactivates at least part of an internal circuit of at least one of the central processing units after completion of the image writing.

8. (Previously Presented) A liquid crystal display device according to claim 1, wherein unchangeable information is displayed on the liquid crystal display.

9. (Previously Presented) A liquid crystal display device according to claim 1, further comprising an operation section with which a user is capable of making an input,

wherein the image writing on the liquid crystal display is carried out in accordance with the input made with the operation section.

10. (Previously Presented) A liquid crystal display device according to claim 9, wherein inactivation of at least part of the power supply circuit is inhibited while an input is being continuously made with the operation section.

11. (Previously Presented) A liquid crystal display device according to claim 1, further comprising a receiving circuit which receives a signal from outside,

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wherein information about reception of a signal at the receiving circuit is displayed on the liquid crystal display.

12. (Previously Presented) A liquid crystal display device according to claim 1, wherein the controller inactivates at least part of the power supply circuit immediately after completion of the image writing.

13. (Previously Presented) A liquid crystal display device according to claim 1, wherein the controller inactivates at least part of the power supply circuit a specified time after completion of the image writing.

14. (Previously Presented) A liquid crystal display device according to claim 1, wherein the controller is capable of operating in a first mode to inactivate at least part of the power supply circuit immediately after completion of the image writing and in a second mode to inactivate at least part of the power supply circuit a specified time after completion of the image writing.

15. (Previously Presented) A portable electronic device comprising:
a liquid crystal display which uses reflective type liquid crystal with a memory effect;

a driving circuit which performs image writing on the liquid crystal display;
a power supply circuit which supplies electric power to the driving circuit, the power supply circuit including one element selected from the group consisting of a booster circuit and a DC/DC converter;

a controller which inactivates at least part of the power supply circuit after completion of the image writing; and

a casing which encases the liquid crystal display, the driving circuit, the power supply circuit and the controller.

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16. (Previously Presented) A method for driving a liquid crystal display device provided with a liquid crystal display which uses reflective type liquid crystal with a memory effect, said method comprising the step of:

after completion of image writing on the liquid crystal display, inactivating at least part of a power supply circuit which supplies electric power to a driving circuit which performs the image writing, the power supply circuit including one element selected from the group consisting of a booster circuit and a DC/DC converter.

17. (Previously Presented) A method for driving a liquid crystal display device according to claim 16, wherein at least part of the power supply circuit is inactivated immediately after completion of the image writing.

18. (Previously Presented) A method for driving a liquid crystal display device according to claim 16, wherein at least part of the power supply circuit is inactivated a specified time after completion of the image writing.

19. (Previously Presented) A portable electronic device comprising:
a liquid crystal display which uses reflective type liquid crystal with a memory effect;
a driving circuit which performs image writing on the liquid crystal display;
a power supply circuit which supplies electric power to the driving circuit;
a controller which inactivates at least part of the power supply circuit after completion of the image writing; and
a casing which encases the liquid crystal display, the driving circuit, the power supply circuit and the controller,
wherein the controller also inactivates at least part of an internal circuit of a data processing unit after completion of the image writing.

20. (Previously Presented) A method for driving a liquid crystal display device provided with a liquid crystal display which uses reflective type liquid crystal with a memory effect, said method comprising the steps of:

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after completion of image writing on the liquid crystal display, inactivating at least part of a power supply circuit which supplies electric power to a driving circuit which performs the image writing, the power supply circuit including one element selected from the group consisting of a booster circuit and a DC/DC converter, and

inactivating at least part of an internal circuit of a data processing unit which is connected to the driving circuit.

21. (Previously Presented) A liquid crystal display device according to claim 7, wherein:

the controller inactivates at least part of an internal circuit of at least one of the central processing units and keeps the remaining one(s) of the central processing units active.

22. (Previously Presented) A liquid crystal display device according to claim 21 wherein:

the at least one central processing unit of which at least part of an internal circuit is inactivated by the controller is higher in processing ability than the remaining one(s) of the central processing units.

23. (Previously Presented) A portable electronic device according to claim 15, wherein:

the reflective type liquid crystal exhibits a cholesteric phase.

24. (Previously Presented) A portable electronic device according to claim 15, wherein:

the liquid crystal display includes a pair of substrates accommodating the reflective type liquid crystal therebetween.

25. (Currently Amended) A portable electronic device comprising:
a liquid crystal display which uses reflective type liquid crystal with a memory effect;

a driving circuit which performs image writing on the liquid crystal display;
a power supply circuit which supplies electric power to the driving circuit;
a controller which inactivates at least part of the power supply circuit after completion of the image [[writing;]] writing, and reactivates the inactivated part of the power supply upon receiving another write command; and

a casing which encases the liquid crystal display, the driving circuit, the power supply circuit and the controller,

wherein the liquid crystal display includes a pair of substrates accommodating the reflective type liquid crystal therebetween, and

wherein at least one of the substrates is flexible.

26. (Previously Presented) A portable electronic device according to claim 24, wherein:

a plurality of resin pillars are provided between the substrates.

27. (Previously Presented) A portable electronic device comprising:
a liquid crystal display which uses reflective type liquid crystal with a memory effect;

a driving circuit which performs image writing on the liquid crystal display;
a power supply circuit which supplies electric power to the driving circuit;
a controller which inactivates at least part of the power supply circuit after completion of the image writing; and

a casing which encases the liquid crystal display, the driving circuit, the power supply circuit and the controller,

wherein the reflective type liquid crystal includes a plurality of display areas.

28. (Previously Presented) A liquid crystal display device comprising:
a liquid crystal display which uses reflective type liquid crystal with a memory effect;

a driving circuit which performs image writing on the liquid crystal display;
a data processing unit which is connected to the driving circuit;

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a power supply circuit which supplies electric power to the driving circuit and the data processing unit, the power supply circuit including one element selected from the group consisting of a booster circuit and a DC/DC converter; and

a controller which inactivates at least part of the power supply circuit and/or at least part of an internal circuit of the data processing unit after completion of the image writing, thereby inhibiting electric power supply to the liquid crystal display.

29. (Previously Presented) A liquid crystal display device according to claim 28, wherein:

power supply from the power supply circuit to the driving circuit is inhibited by the controller.

30. (Previously Presented) A liquid crystal display device according to claim 28, wherein:

the reflective type liquid crystal exhibits a cholesteric phase.

31. (Previously Presented) A portable electronic device according to claim 15, wherein the controller also inactivates at least part of an internal circuit of a data processing unit after completion of the image writing.

32. (Previously Presented) A method for driving a liquid crystal display device according to claim 16, further comprising the step of inactivating at least part of an internal circuit of a data processing unit which is connected to the driving circuit.

33. (Previously Presented) A portable electronic device according to claim 24, wherein at least one of the substrates is flexible.

34. (Previously Presented) A portable electronic device according to claim 15, wherein the reflective type liquid crystal includes a plurality of display areas.

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35. (Previously Presented) A liquid crystal display device comprising:
a liquid crystal display which uses reflective type liquid crystal with a memory effect;
a driving circuit which performs image writing on the liquid crystal display in response to a received write command;
a power supply circuit which supplies electric power to the driving circuit; and
a controller, which inactivates at least part of the power supply circuit after completion of the image writing, and reactivates the inactivated part of the power supply upon receiving another write command.

36. (Previously Presented) A liquid crystal display device according to claim 35, wherein the power supply circuit includes one element selected from a group consisting of a booster circuit and a DC/DC converter.

37. (Previously Presented) A liquid crystal display device according to claim 35, wherein the controller inactivates at least a part of the power supply circuit substantially immediately after completion of the image writing.

38. (Previously Presented) A portable electronic device comprising:
a liquid crystal display which uses reflective type liquid crystal with a memory effect;
a driving circuit which performs image writing on the liquid crystal display in response to receipt of a write command;
a power supply circuit which supplies electric power to the driving circuit;
a controller which inactivates at least part of the power supply circuit after completion of the image writing and which reactivates the inactivated part of the power supply after another write command is received; and
a casing which encases the liquid crystal display, the driving circuit, the power supply circuit and the controller.

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39. (Previously Presented) A portable electronic device according to claim 38, wherein the power supply circuit includes one element selected from the group consisting of a booster circuit and a DC/DC converter.

40. (Previously Presented) A portable electronic device according to claim 38, wherein the controller inactivates at least a part of the power supply circuit substantially immediately after completion of the image writing.

41. (Previously Presented) A method for driving a liquid crystal display device provided with a liquid crystal display which uses reflective type liquid crystal with a memory effect, said method comprising the step of:

after receiving a write command and completing image writing on the liquid crystal display, inactivating at least part of a power supply circuit which supplies electric power to a driving circuit which performs image writing, and reactivating the inactivated part of the power supply upon receipt of another write command.

42. (Previously Presented) A method for driving a liquid crystal display device according to claim 41, wherein the power supply circuit includes one element selected from the group consisting of a booster circuit and a DC/DC converter.

43. (Previously Presented) A method for driving a liquid crystal display device according to claim 41, wherein a controller inactivates at least a part of the power supply circuit substantially immediately after completion of the image writing.

44. (Previously Presented) A liquid crystal display device comprising:
a liquid crystal display which uses reflective type liquid crystal with a memory effect;

a driving circuit which performs image writing on the liquid crystal display in response to a received write command;

a data processing unit which is connected to the driving circuit;

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a power supply circuit which supplies electric power to the driving circuit and the data processing unit, and

a controller which inactivates at least part of the power supply circuit and/or at least part of an internal circuit of the data processing unit after completion of the image writing, thereby inhibiting electric power supply to the liquid crystal display, and thereafter reactivating the inactivated part of the power supply circuit and/or at least part of the internal circuit of the data processing unit after receipt of another write command.

45. (Previously Presented) A liquid crystal display device according to claim 44, wherein the power supply circuit includes one element selected from the group consisting of a booster circuit and a DC/DC converter.

46. (Previously Presented) A liquid crystal display device according to claim 44, wherein the controller inactivates at least a part of the power supply circuit and/or at least a part of the internal circuit of the data processing unit substantially immediately after completion of image writing.